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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/802,116	03/16/2004	Jefferson G. Shingleton	PWRL 1030-3	3332
22470 7590 06/21/2007 HAYNES BEFFEL & WOLFELD LLP P O BOX 366 HALF MOON BAY, CA 94019			EXAMINER HALL, ASHA J	
			ART UNIT 1709	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/802,116

Applicant(s)

SHINGLETON, JEFFERSON G.

Examiner

Asha Hall

Art Unit

1709

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>See Continuation Sheet</u> . | 6) <input type="checkbox"/> Other: _____ |

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :8/16/2004, 1/3/2005, 4/25/2005, and 12/5/2005

DETAILED ACTION

Specification

1. The abstract of the disclosure is objected to because it exceeds the limit of 150 words. Correction is required. See MPEP § 608.01(b).

Claim Objections

2. Claims 32-36 objected to because of the following informalities: Claims 32-26 recites "an installation" but depend on claim 4, which is "an assembly".
Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Prideaux et al. (4,429,178).

With respect to claim 1, Prideaux et al. discloses a tracking solar collector (Figure 3) of the type comprising a series of supports (36) oriented on a generally north-south axis (disclosed in the abstract); a torsion tube (40), having a torsion tube axis (40), rotatably mounted to the supports (42) to permit rotation of the torsion tube about the torsion tube axis (col.4; lines: 29-36); a torsion tube rotator (44) operably coupled to the torsion tube (40) so to rotate the torsion tube between morning, noontime, and evening angular orientations (sunrise to sunset) (col.1; lines: 46-49); and solar panels/solar

Art Unit: 1709

photovoltaic (PV) flat panels (32), each having a center of gravity (Figure 3), the improvement comprising mounting structure securing the solar panels (32) to the torsion tube at a chosen angle (acute angle) to the torsion tube axis (col.3; lines: 16-21).

With respect to claim 2, Prideaux et al. discloses a tracking solar collector (Figure 3) according to claim 1, wherein each of the solar panels is located entirely vertically above (col.1; lines: 46-49) the torsion tube axis (40) when the torsion tube is at the noontime angular orientation (col.1; lines: 54-59).

In regard to claim 3, Prideaux et al. discloses the solar collector according to claim 1 wherein the mounting structure further comprises: first and second plates (Figure 1 & 2A), each said plate (14) having a generally triangular torsion tube portion (16), located on opposite sides of the torsion tube (16); an elongated, generally rectangular solar panel portion extending at an angle from the torsion tube portion (Figure 2 a,b); and fasteners extending through or around the torsion tube portions (16) and the torsion tube (16)

2. Claims 4-21 and 25-33 are rejected under 35 U.S.C. 102(b) as being anticipated by Shingleton (6,058,930).

With respect to claim 4, Shingleton discloses a tracking solar collector assembly as shown in Figure 10 comprising: first and second Southside supports/lower support piers (36); first, second and third North side supports/lower support piers (36) (col.1; lines: 38-41); the Southside supports/lower support piers (36) and the North side supports/upper support piers (36) defining first and second generally parallel paths

Art Unit: 1709

(Figure 10); first and second solar collector support structures with each solar collector support structure having first and second spaced apart pivotal support points (col.3; lines: 12-15), said first and second support points defining a tilt axis as shown in Figure 10 (col.3; lines: 16-22).

- Shingleton further discloses wherein at least one solar collector (34) mounted to each solar collector support structure (36) (col. 7; lines: 34-39); and the first support points of the first and second solar collector support structures pivotally connected to and supported by the first and second Southside supports/ lower pier supports (36), respectively (col.1; lines: 61-64).
Furthermore, as shown in Figure 10, the second support point (36) of the first solar collector support structure (36) is pivotally connected to and is supported by the first and second North side supports/upper pier supports (36) (col.1; lines: 61-64).
- Shingleton further discloses that the second support point of the second solar collector support structure/pier support (36) is pivotally connected to and is supported by the second and third North side supports/upper pier supports (36); and a tilting assembly comprising of: a drive element (42) secured to each solar collector support structure as shown in Figure 10 (col.3; lines: 12-15).
- Shingleton further discloses in Figure 10 a drive element coupler (42) operably coupling the drive elements (col.1; lines: 41-44), the drive elements

Art Unit: 1709

and the drive element coupler creating a drive assembly (col.3; lines: 26-32);
and a driver coupled to the drive assembly so that operation of the driver causes the drive elements move in unison thus causing the solar collector support structures and the solar collectors therewith to tilt in unison (col.3; lines: 16-22).

In regard to claim 5, Shingleton discloses the assembly according to claim 4 above, wherein at least one tilt axis is at an angle to a horizontal line (Figure 4A).

With respect to claim 6, Shingleton discloses the assembly according to claim 5 above, wherein said angle is between about 15° to 30° (col.7; lines: 9-14) (Figure 7).

In regard to claim 7, Shingleton discloses the assembly according to claim 5, wherein said support element is a variable-length support element (64) as shown in Figure 3B and Figure 3C to permit said angle to be changed (col.4; lines: 21-24).

With respect to claim 8, Shingleton discloses the assembly according to claim 4, wherein the first and second paths are generally East-West paths (col.; lines: 30-31).

In regard to claim 9, Shingleton discloses the assembly according to claim 4, wherein the drive element/drive actuator (42) is secured to each solar collector support structure at a point between the first and second support points/pier support (36) as shown in Figure 10 (col.7; lines: 34-38).

With respect to claim 10, Shingleton discloses the assembly according to claim 4, wherein a plurality of said solar collectors (34) are mounted to the solar collector support structures (36) (Figure 10).

Art Unit: 1709

In regard to claim 11, Shingleton discloses the assembly according to claim 10, wherein the solar collectors define an array (80) of solar collectors having generally parallel lateral sides (Figure 9).

With respect to claim 12, Shingleton discloses the assembly according to claim 4 wherein the solar collector comprises a PV module (col.1; lines: 12-15).

In regard to claim 13, Shingleton discloses the assembly according to claim 4, wherein the first and second Southside supports/lower pier supports (36) are generally vertically aligned with the tilt axes of the first and second solar collector support structures (36), respectively (Figure 10).

With respect to claim 14 and 15, Shingleton discloses the assembly according to claim 4, wherein the second North side support/upper support (36) is laterally midway and between the tilt axes of the first and second solar collector support structures as shown in Figure 10 (col.7; lines: 34-40).

For claims 16-21, Shingleton discloses the base/torsion arm (66) in Figure 3A to 3C, wherein the North/upper half of rows (50) of solar panels (54) are further disclosed in Figure 9A to 9C. In Figure 10, Shingleton shows the support/piers (36) underneath the rows of solar panels, wherein each support point is interpreted as the point where the pier is in contact with the rows of the solar panels.

Thereby in regard to claim 16, Shingleton discloses the assembly according to claim 4, wherein the first, second and third North side supports each include a base securable to a support surface/torsion tube arm (66), each base laterally offset from the

Art Unit: 1709

tilt axes (52) of the first and second solar collector support structures as shown in Figure 3B.

With respect to claim 17, Shingleton discloses the assembly according to claim 16, wherein the base of the second North side support/upper support is laterally midway and between the tilt axes of the first and second solar collector support structures (col.7; lines: 34-40).

In regard to claim 18, Shingleton discloses the assembly according to claim 4, wherein each North side support/upper support comprises a base, mountable to a support surface, and at least one support element connecting the base to a second support point (Figure 3B).

With respect to claims 19 and 20, Shingleton discloses the assembly according to claim 18 wherein the base of the second North side support/upper pier supports (36) is positioned generally equidistant from the second support points/pier supports of the first and second solar collector support structures (Figure 10). Shingleton further wherein said support element is a fixed-length support element as shown in Figure 10.

In regard to claim 21, Shingleton discloses comprising a fourth North side support/upper pier supports (36), and wherein: the second support point (each support point is interpreted as the point where the pier is in contact with the rows of the solar panels- col.1; lines: 38-41) of the first solar collector support structure is pivotally connected (42) to and supported by the first, second and third North side supports/upper pier supports (36) as shown in Figure 10. Shingleton further discloses that the second support point of the second solar collector support structure/support

Art Unit: 1709

piers (36) is pivotally connected (42) (col.2; lines: 38-40) to and supported by the second, third and fourth North side supports/upper pier supports (36) as shown in Figure 10 (col.1; lines: 61-65 and col.6; lines: 16-22). Furthermore, Shingleton discloses that the row of solar panels is mounted on a torsion tube that is support in the bearing members atop one or more piers, each pier having a footing supported in the earth (col.6; lines: 16-18).

In regard to claim 25, Shingleton discloses the assembly according to claim 4 above, wherein the solar collector support structure comprises a torque tube extending along the tilt axis (col. 2; lines: 3-11).

With respect to claim 26, Shingleton discloses the assembly according to claim 25 above, wherein the solar collector support structure comprises module rails/ torque arms (66) secured to the torque tube (56) and extending laterally from the torque tube as shown in Figure 3A to 3C.

In regard to claims 27-31, Shingleton discloses a tracking solar collector installation comprising a tracking solar collector assembly according to claim 4 mounted to a support surface/ mounting on a footing supported by the earth/ground/roof/parking ramp/artificial surface (e.g. reservoir cover) (col.3; lines: 23-26 and col.8; lines: 41-45). Shingleton further discloses that the support surface/ground is an uneven terrain (gravel) (col.3; lines: 35-37).

With respect to claim 32, Shingleton discloses the installation according to claim 4 wherein a plurality of solar collectors/panels are mounted to the solar collector support structures (col.3; lines: 11-15), said plurality of solar collectors defining a gap between

Art Unit: 1709

the solar collectors as shown in Figure 9A-9C, the gap extending perpendicular to the tilt axis/drive actuator (42).

In regard to claim 33, Shingleton discloses the installation according to claim 32, wherein at least one of the North side/upper supports comprises laterally extending support elements extending generally perpendicular to the tilt axes (42) and aligned with the gap so that tilting the solar collector support structures as shown in Figure 10, and the solar collectors/panels causes the laterally extending support elements to pass through the gap (Figure 9A to 9C).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 22-24 and 34-36 are rejected under 35 U.S.C. 103(a) as being obvious over Shingleton (6,058,930) in view of Osterwisch (5,758,938).

With regard to claims 22-24, Shingleton discloses the assembly according to claim 21 above, wherein the second support point (each support point is interpreted as the point where the pier is in contact with the rows of the solar panels- col.1; lines: 38-41) of the first solar collector support structure is connected to the first and third North side supports/pier support (36), but fails to disclose that the support structure is vertically aligned by tension or compression struts comprised as a post.

Osterwisch discloses a solar concentrator panel support assembly (Figure 1) and further discloses an actuator member (32), which acts as a strut or a brace/cable/posts (vertically aligned) that assists the mechanism in resisting compression and tension forces as shown in Figure 1 (col.2; lines: 39-47). Osterwisch teaches that this is important because commercial solar concentrators and associated equipment are often very large and gravitational and wind related forces that place substantial forces on the solar concentrator drive mechanisms (col.2; lines: 39-47). It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the struts of Osterwisch et al. to the photovoltaic panel support assembly of Shingleton in order to compensate for very large and gravitational and wind related forces that place substantial forces on the solar concentrator drive mechanisms.

7. Claims 34-36 are rejected under 35 U.S.C. 103(a) as being obvious over Shingleton (6,058,930) in view of Laing et al. (5,445,177).

With regard to claims 34-36, Shingleton discloses the assembly according to 33 above, wherein the second support point (each support point is interpreted as the point where the pier is in contact with the rows of the solar panels- col.1; lines: 38-41) of the first solar collector support structure is connected to the first and third North side supports/upper pier support (36), and wires/flexible cables may be run inside of the tubular members (col.6; lines: 45-48), but fails to disclose that the support structure or tubular members are comprised of struts/rods.

Laing et al. discloses a photovoltaic panel support assembly (Figure 3) and further discloses supports such as struts (34) and cables (34a) as shown in Figure 3

Art Unit: 1709

(col.4; lines: 48-49) and rods-shaped units (col.6; lines: 35-37), wherein strut (44) and cables as shown in Figure 4 are flexed around an axis perpendicular to the focal line (19) of the sun rays not to obstruct the sun rays (col. 6; lines: 3-6) which is connected to the base member (col.4; lines: 7-11). It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the support struts/ flexible cables/rods of Laing et al. to the photovoltaic panel support assembly of Shingleton in order to around an axis perpendicular to the focal line of the sun rays thereby not obstructing the sun rays.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Asha Hall whose telephone number is 571-272-9812. The examiner can normally be reached on Monday-Friday 7:30-5:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1709

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AJH



ALEXA D. NECKEL
SUPERVISORY PATENT EXAMINER